

**CITY OF NEWDALE (PWS 7220047)**  
**SOURCE WATER ASSESSMENT FINAL REPORT**

---

**October 17, 2002**



**State of Idaho**  
**Department of Environmental Quality**

**Disclaimer:** This publication has been developed as part of an informational service for the source water assessments of public water systems in Idaho and is based on data available at the time and the professional judgement of the staff. Although reasonable efforts have been made to present accurate information, no guarantees, including expressed or implied warranties of any kind, are made with respect to this publication by the State of Idaho or any of its agencies, employees, or agents, who also assume no legal responsibility for the accuracy of presentations, comments, or other information in this publication. The assessment is subject to modification if new data is produced.

## Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated source water assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *City of Newdale, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The City of Newdale drinking water system consists of two well sources. Both wells have high susceptibility to all categories of potential contaminants: inorganic, synthetic organic, volatile organic and microbial contamination. The high scores of the hydrologic sensitivity and the system construction of both wells contributed greatly to the high susceptibility ratings for both wells. The major transportation corridor (Highway 33) as well as the predominant agricultural land use contributed the most points to the high ratings. Well #2 rated automatically high for IOCs due to detections of fluoride in the well above maximum contaminant levels (MCLs). Sanitary Surveys for the wells were unavailable and the well log for Well #1, the backup well, was unavailable, increasing the scores for hydrologic sensitivity and system construction.

There are a few current significant potential water problems affecting the wells of the City of Newdale. Total coliform had repeat detections in the distribution system in November 1994, September 1996, August 1998, September 1998, and June 2000. Well #2 recorded a detection of the inorganic contaminant (IOC) fluoride in January 1994 at 4.48 milligrams per liter (mg/l) and in December 1998 of 4.38 mg/l, values above the maximum concentration level of 4 mg/l. Also in Well #2, arsenic was detected in December 1998 at 16 parts per billion (ppb). Though the current MCL is 50 parts per billion (ppb), EPA is in the process of lowering the arsenic standard to 10 ppb. The inorganic contaminant (IOC) cadmium has been detected in Well #2 at levels under the MCL. Nitrate concentrations have been recorded in Well #2 at levels below 2.2 mg/L. The Maximum Contaminant Level (MCL) for nitrate is 10 mg/L. Neither of the wells has recorded the presence of volatile organic (VOC) or synthetic organic contamination (SOC) during any water chemistry tests. Surrounding agricultural land use practices have contributed to the ratings of "High" for county level nitrogen fertilizer use, county level herbicide use, and total county level Ag-chemical use.

It is unknown if the drinking water system of the City of Newdale presently has a disinfection system in place. However, the City of Newdale should be aware that the potential for contamination of the aquifer exists.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the wells of the City of Newdale, drinking water protection activities should focus on correcting any deficiencies outlined in the Sanitary Surveys (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity), including protection of the wells from surface flooding. Also, disinfection practices should be implemented if microbial contamination becomes a problem. When the arsenic standard is reduced, the City of Newdale may need to implement measures to protect the drinking water of Well #2. Arsenic contamination may exceed the new drinking water standards and the detection of fluoride contamination currently exceeds the MCL in Well #2, the City of Newdale should investigate various engineering solutions like ion exchange, reverse osmosis, or activated alumina that could be used to treat this problem. No chemicals should be stored or applied within the 50-foot radius of the wellheads. Additionally, there should be a focus on the implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources within the delineation zone. Since much of the designated protection areas are outside the direct jurisdiction of the City of Newdale, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation is near urban and residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there is a transportation corridor through the delineation, the Idaho department of transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

# SOURCE WATER ASSESSMENT FOR THE CITY OF NEWDALE, IDAHO

## Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment is also included.

### Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

### Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

## **Section 2. Conducting the Assessment**

### **General Description of the Source Water Quality**

The public drinking water system for the City of Newdale is comprised of two ground water wells that serve approximately 400 people through approximately 115 connections for community use. Situated in Fremont County, Well #1 is located along Highway 33 approximately ½ mile west of Newdale and Well #2 is located in the center of the City of Newdale (Figure 1).

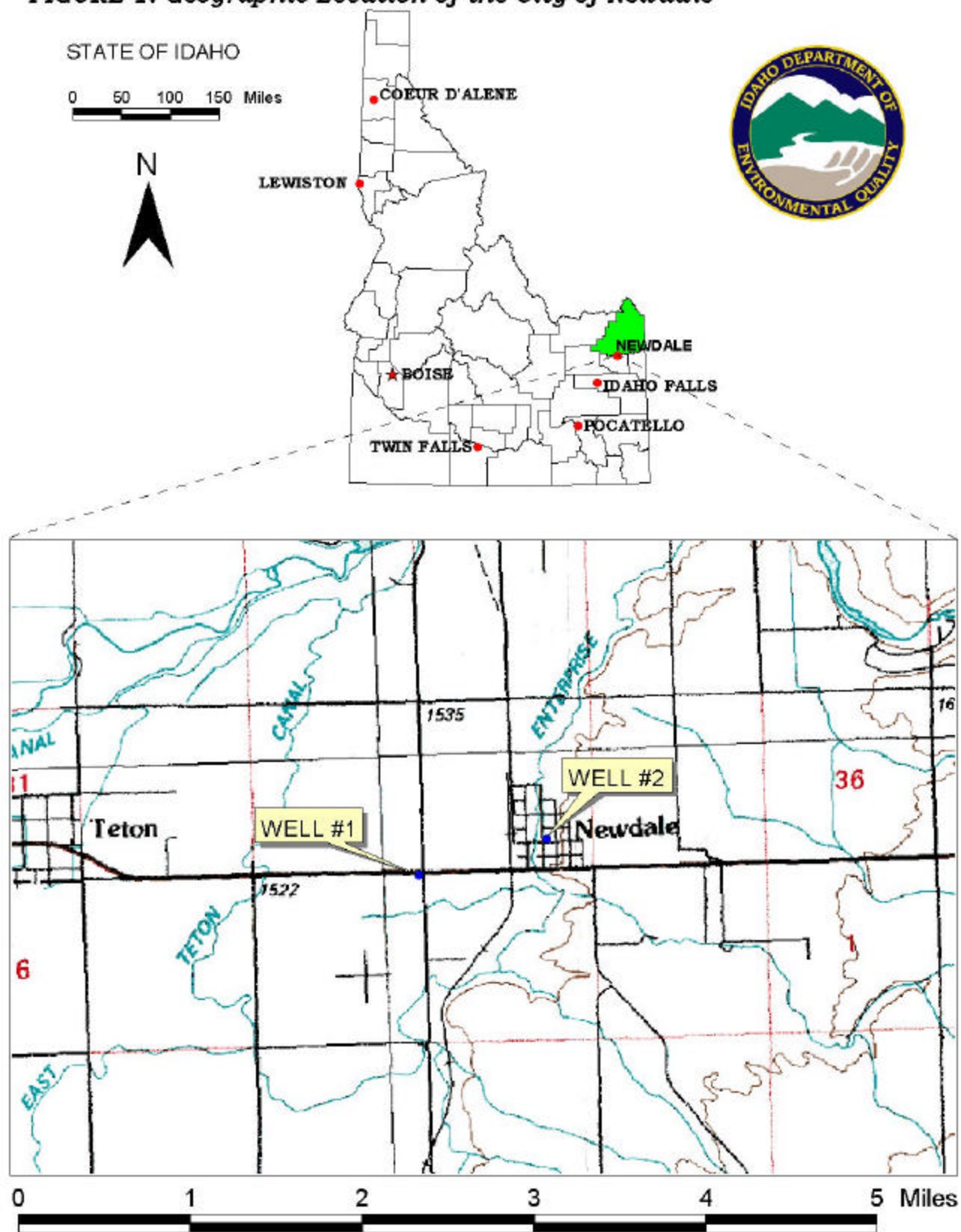
There are a few current significant potential water problems affecting the wells of the City of Newdale. Total coliform had repeat detections in the distribution system in November 1994, September 1996, August 1998, September 1998, and June 2000. Well #2 recorded detections of the inorganic contaminant (IOC) fluoride in January 1994 at 4.48 milligrams per liter (mg/L) and again in December 1998 of 4.38 mg/L, values exceeding the maximum concentration level of 4 mg/L. Also in Well #2, arsenic was detected in December 1998 at 16 ppb. Though the current MCL is 50 ppb, EPA is in the process of lowering the arsenic standard to approximately 10 ppb. The inorganic contaminant (IOC) cadmium has been detected in Well #2 at levels under the MCL. Nitrate concentrations have been recorded in Well #2 at levels below 2.2 mg/L. The Maximum Contaminant Level for nitrate is 10 mg/L. Neither of the wells has recorded the presence of volatile organic or synthetic organic contamination during any water chemistry tests. Surrounding agricultural land use practices have contributed to the ratings of “High” for county level nitrogen fertilizer use, county level herbicide use, and total county level Ag-chemical use.

### **Defining the Zones of Contribution – Delineation**

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with Washington Group, International (WGI) to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Eastern Snake River Plain (ESRP) aquifer in the vicinity of the wells of the City of Newdale. The computer model used site specific data, assimilated by WGI from a variety of sources including the City of Newdale operator input, local area well logs, and hydrogeologic reports (detailed below).

The ESRP is a northeast trending basin located in southeastern Idaho. Ten thousand square miles of the basin are primarily filled with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with terrestrial and lacustrine (lake-deposited) sediments along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet in thickness and average 20 to 25 feet (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

**FIGURE 1. Geographic Location of the City of Newdale**



The plain is bound on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain. Rivers and streams entering the plain from the south are tributary to the Snake River. Other than the Big and Little Wood rivers, rivers entering from the north vanish into the highly transmissive basalts of the Snake River Plain aquifer.

The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet it may be locally confined in some areas because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from several hundred feet near the plain's margin to thousands of feet near the center.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

The Upper ESRP hydrologic province is located on the northeastern margin of the ESRP. The majority of the province is located above the confluence of the South and Henrys Forks of the Snake River in southwestern Madison County. The province occupies portions of Fremont, Madison, Jefferson, and Bonneville counties. The province covers 445 square miles, which is 4.3 percent of the ESRP's total area.

Published water table maps specific to the Upper ESRP regional aquifer are limited. The few area-specific maps that are available (e.g., Crosthwaite et al., 1967, p. 27, and Baker, 1991, p. 10) show similar patterns of flow to those depicted at the regional scale. Regional ground water flow is to the southwest paralleling the basin (Cosgrove et al., 1999, p. 21; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Ground water flow direction at the local scale is thought to be highly variable due to preferential flow paths through the fractured and layered basalts.

The delineated source water assessment areas for the wells of the City of Newdale can best be described as pie-shaped corridors approximately four miles long extending along Highway 33 to the east of the wellheads (Figure 2 and Figure 3). The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

### **Identifying Potential Sources of Contamination**

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and others, such as cryptosporidium, and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area of Well #1 of the City of Newdale consists of irrigated agriculture and transportation uses, while the surrounding area is predominantly residential and irrigated agriculture. Land use within the immediate area of Well #2 is residential and transportation uses, while the surrounding area is predominantly irrigated agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

### Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in July through August 2001. The first phase involved identifying and documenting potential contaminant sources within the City of Newdale Source Water Assessment Area (Figure 2) through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

The delineated source water areas encompass pie-shaped corridors of land between the well sites along Highway 33. The delineations (Table 1, Figure 2 and Figure 3) of both wells have five potential contaminant sources each, including a geothermal mine, a closed underground storage tank (UST) site and Highway 33 that runs through the 3-year, 6-year, and 10-year times of travel (TOT) within the delineations.

**Table 1. Potential Contaminant Inventory for the City of Newdale Wells.**

Site #	Source Description <sup>1</sup>	TOT ZONE <sup>2</sup>	Source of Information	Potential Contaminants <sup>3</sup>
1	Mine	0 - 3	Database Search	IOC, VOC, SOC,
2	UST – Closed	3 - 6	Database Search	VOC, SOC
	Highway 33	0 - 3	GIS Map	IOC, VOC, SOC, Microbes
	Highway 33	3 – 6	GIS Map	IOC, VOC, SOC
	Highway 33	6 – 10	GIS Map	IOC, VOC, SOC

<sup>1</sup> SARA = Superfund Amendments and Reauthorization Act, WLAP = wastewater land application

<sup>2</sup> TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

<sup>3</sup> IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical



**Figure 2. City of Newdale Delineation Map and Potential Contaminant Source Locations**

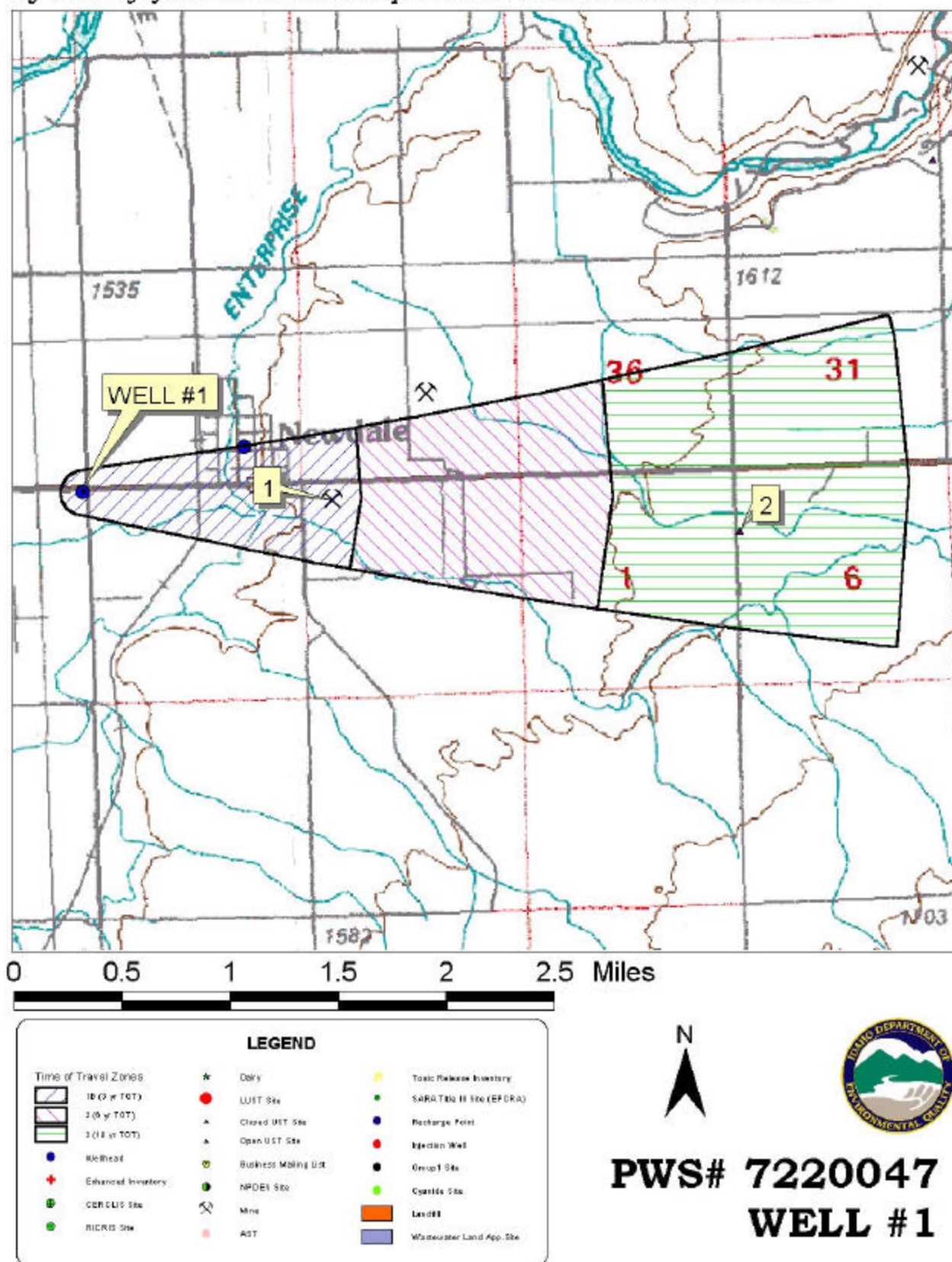
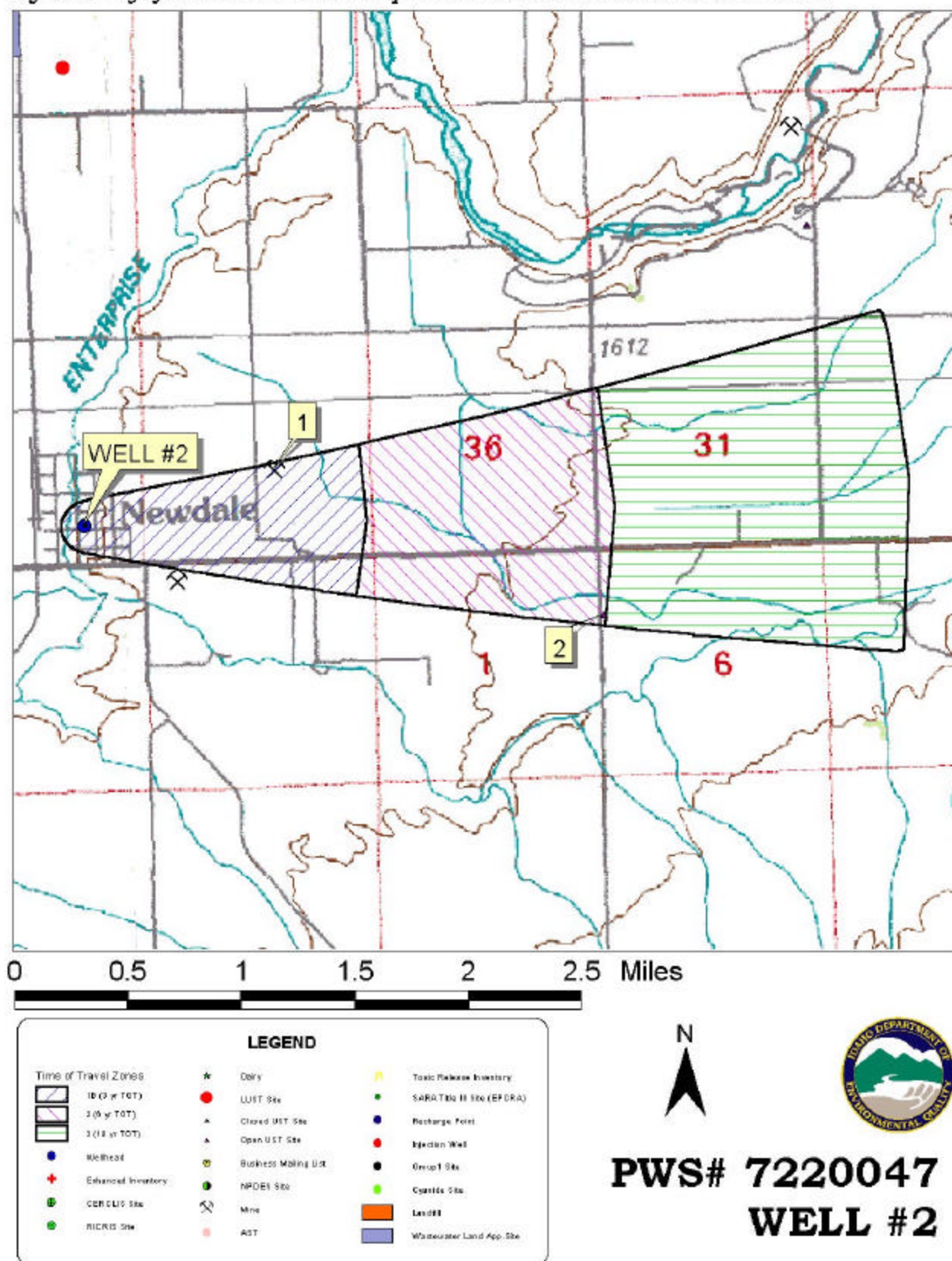


Figure 3. City of Newdale Delineation Map and Potential Contaminant Source Locations



### **Section 3. Susceptibility Analyses**

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. Each of these three categories carries the same weight in the final assessment, meaning that a low score in one category coupled with higher scores in the other categories can still lead to a overall susceptibility of high. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheet for the system. The following summaries describe the rationale for the susceptibility ranking.

#### **Hydrologic Sensitivity**

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity rates high for both wells (Table 2). The soils surrounding the area of the wellheads are in the moderate to well-drained soil class. The well log for Well #1 was unavailable, preventing a determination of the depth to ground water, composition of the vadose zone, or presence of low permeability layers. The well log for Well #2 indicates that the vadose zone is composed primarily of sand, gravel, and lava rock. It also shows a lack of sedimentary interbeds between basalt layers above the producing zone of the well. The depth to first ground water for Well #2 is at 100 feet below ground surface (bgs).

#### **Well Construction**

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in Sanitary Surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.



The City of Newdale wells have a high system construction score. Sanitary surveys for either of the wells were not available, preventing a determination of the current maintenance of the wellhead and surface seals of both wells and the level of protection of the wells from surface flooding. The well log for Well #1 was not available. The well log for Well #2 indicates that this well was drilled in 1993 to a depth of 350 feet using a 14-inch casing at 0.315-inch thickness. The casing was installed to a depth of 285 feet in a layer of sand and black lava. The well log shows that the highest production level of Well #2 is at 230 feet, 41 feet below the water table.

Though the well may have been in compliance with standards when it was completed, current public water system (PWS) well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. A fourteen-inch diameter well requires a casing thickness of at least 0.375-inches.

### **Potential Contaminant Source and Land Use**

Both wells of the City of Newdale rate high for IOCs (i.e. nitrates arsenic) and SOCs (i.e. pesticides) moderate for VOCs (i.e. petroleum products) and low for microbial contaminants (i.e. bacteria). The local transportation corridor (Highway 33) that extends through all three TOT zones of the delineation as well as the predominant agricultural land use in the delineated source area account for the largest contribution of points to the potential contaminant inventory rating.

The wells are in a county with high nitrate fertilizer use, high levels of herbicide use, and high total ag-chemical use. Total coliform bacteria were repeatedly detected in the distribution system of wells in November 1994, September 1996, August 1998, September 1998, and June 2000. However, there have been no total coliform repeat detections in the wells. Well #2 has consistently shown nitrate (an IOC) at levels below 2.2 mg/L (the MCL is 10 mg/L). However, fluoride (IOC) has been detected in Well #2 at levels above the MCL of 4 mg/L. Arsenic has been detected in Well #2 at 16ppb. Though the current MCL is 50 ppb, EPA is in the process of lowering the arsenic standard to 10 ppb. No VOCs or SOCs have been detected in the wells.

### **Final Susceptibility Ranking**

A detection above a drinking water standard MCL or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, if there are contaminant sources located within 50 feet of the source then the wellhead will automatically get a high susceptibility rating. In this case, Well #2 of the City of Newdale drinking water system received an automatic high susceptibility score for IOCs because fluoride was detected at levels exceeding the current MCL. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, both of the City of Newdale wells rate high for all categories of potential contaminants.

**Table 2. Summary of City of Newdale Susceptibility Evaluation**

Well	Susceptibility Scores <sup>1</sup>									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	H	M	H	L	H	H	H	H	H
Well #2	H	H	M	H	L	H	H(*)	H	H	H

<sup>1</sup>H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

(\*) = An automatic high score for fluoride exceeding the MCL and a high number of points

### Susceptibility Summary

Overall, both of the wells of the City of Newdale rank high for IOCs, VOCs, SOC, and microbial contaminants. The heavily weighted high scores of hydrologic sensitivity and system construction contributed greatly to the high susceptibility ratings for both wells. Highway 33, a major transportation corridor that runs through all three TOT zones of both delineations and could add leachable chemicals to the aquifer, contributed many points. The intense agricultural practices and the high county-wide use of agricultural chemicals also added points to the high susceptibility ratings.

There are a few significant potential water problems currently affecting the City of Newdale wells. Fluoride was detected in Well #2 above the MCL at 4.48 mg/L in January 1994 and in December 1998 at 4.38 mg/L. The MCL for fluoride is 4 mg/L. In the distribution system of the wells, total coliform bacteria were detected in November 1994, September 1996, August 1998, September 1998, and in June 2000. No total coliform bacteria have been detected at the wellheads so far. Cadmium and nitrate (IOCs) have been detected in Well #2 at levels far below the current MCLs. Arsenic (IOC) has been detected in Well #2 at 16 ppb. Though the current MCL is 50 ppb, EPA is in the process of lowering the arsenic standard to approximately 10 ppb. No VOCs or SOC, have been detected in the well water. The delineation crosses areas of concern related to high ratings of “county level nitrogen fertilizer use”, “county level herbicide use”, and “total county level Ag-chemical use”.

### Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the wells of the City of Newdale, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary surveys (inspections conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity), including protection of the wells from surface flooding. Also, disinfection practices should be implemented if microbial contamination becomes a problem. When the arsenic standard is reduced, the City of Newdale may need to implement measures to protect the drinking water of Well #2. Since arsenic contamination may exceed the new drinking water standards and the detection of fluoride contamination currently exceeds the MCL in Well #2, the City of Newdale should investigate various engineering solutions like ion exchange, reverse osmosis, or activated alumina that could be used to treat this problem. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Additionally, there should be a focus on the implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources within the delineation zone. Since much of the designated protection areas are outside the direct jurisdiction of the City of Newdale, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any source water protection plan as the delineation is near to urban and residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the U.S. Environmental Protection Agency. As there are transportation corridors through the delineation, the Idaho department of transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive source water assessment protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

## **Assistance**

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office      (208) 528-2650

State DEQ Office      (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, Idaho Rural Water Association, at 208-343-7001 (<mailto:mlharper@idahoruralwater.com>) for assistance with drinking water protection (formerly wellhead protection) strategies.

## POTENTIAL CONTAMINANT INVENTORY

### LIST OF ACRONYMS AND DEFINITIONS

**AST (Aboveground Storage Tanks)** – Sites with aboveground storage tanks.

**Business Mailing List** – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

**CERCLIS** – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund, is designed to clean up hazardous waste sites that are on the national priority list (NPL).

**Cyanide Site** – DEQ permitted and known historical sites/facilities using cyanide.

**Dairy** – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

**Deep Injection Well** – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

**Enhanced Inventory** – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

**Floodplain** – This is a coverage of the 100-year floodplains.

**Group 1 Sites** – These are sites that show elevated levels of contaminants and are not within the priority one areas.

**Inorganic Priority Area** – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

**Landfill** – Areas of open and closed municipal and non-municipal landfills.

**LUST (Leaking Underground Storage Tank)** – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

**Mines and Quarries** – Mines and quarries permitted through the Idaho Department of Lands.)

**Nitrate Priority Area** – Area where greater than 25% of wells/springs show nitrate values above 5 mg/L.

**NPDES (National Pollutant Discharge Elimination System)** – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

**Organic Priority Areas** – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

**Recharge Point** – This includes active, proposed, and possible recharge sites on the Snake River Plain.

**RICRIS** – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

**SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities)** – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

**Toxic Release Inventory (TRI)** – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

**UST (Underground Storage Tank)** – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

**Wastewater Land Applications Sites** – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

**Wellheads** – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

**NOTE:** Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.



## References Cited

- Ackerman, D.J., 1995, Analysis of Steady-State Flow and Advective Transport in the Eastern Snake River Plain Aquifer System, Idaho, U.S. Geological Survey Water-Resources Investigations Report 94-4257, I-FY95, 25 p.
- Baker, S.J., 1991, Effects of Exchange Wells on the Teton River in the Rexburg-Teton Area, Madison and Fremont Counties, Idaho, Idaho Department of Water Resources, Open-File Report, 17p.
- Cosgrove, D.M., G.S. Johnson and S. Laney, 1999, Description of the IDWR/UI Snake River Plain Aquifer Model (SRPAM), Idaho Water Resources Research Institute, 95 p.
- Crosthwaite, G.E., M.J. Mundorff, and E.H. Walker, 1967, Ground-Water Aspects of the Lower Henrys Fork Region, Idaho, U.S. Geological Survey, Water-Resources Division, Open-File Report, 43 p.
- DeSonneville, J.L.J., 1972, Development of a Mathematical Groundwater Model: Water Resources Research Institute, University of Idaho, Moscow, Idaho, 227 p.
- Division Seven Health Department, 1994. GWUDI Field Survey for PWS #7220050. October 1994.
- Garabedian, S.P., 1992, Hydrology and Digital Simulation of the Regional Aquifer System, Eastern Snake River Plain, Idaho, U.S. Geological Survey Professional Paper 1408-F, 102 p.
- Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."
- Idaho Department of Agriculture, 1998. Unpublished Data.
- Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.
- Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.
- Lindholm, G.F., 1996, Summary of the Snake River Plain Regional Aquifer-System Analysis in Idaho and Eastern Oregon, U.S. Geological Survey Professional Paper 1408-A, 59 p.
- Whitehead, R.L., 1992, Geohydrological Framework of the Snake River Plain Regional Aquifer System, Idaho and Eastern Oregon, U.S. Geological Survey Professional Paper 1408-B, I-FY92, 32 p.

## Attachment A

### City of Newdale Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- $\geq 13$  High Susceptibility

## 1. System Construction

SCORE

Drill Date		
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	NO	0
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	NO	1

Total System Construction Score 6

## 2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2

Total Hydrologic Score 6

## 3. Potential Contaminant / Land Use - ZONE 1A

IOC Score	VOC Score	SOC Score	Microbial Score
-----------	-----------	-----------	-----------------

Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

## Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	2	2	2	1
(Score = # Sources X 2 ) 8 Points Maximum		4	4	4	2
Sources of Class II or III leacheable contaminants or	YES	5	2	1	
4 Points Maximum		4	2	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		4	4	4	4

Total Potential Contaminant Source / Land Use Score - Zone 1B 12 10 9 6

## Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II Greater Than 50% Irrigated Agricultural Land		2	2	2	

Potential Contaminant Source / Land Use Score - Zone II 5 5 5 0

## Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	

Total Potential Contaminant Source / Land Use Score - Zone III 3 3 3 0

Cumulative Potential Contaminant / Land Use Score 24 20 21 8

## 4. Final Susceptibility Source Score

17 16 16 15

## 5. Final Well Ranking

High High High High

## 1. System Construction

## SCORE

Drill Date	9/20/1993	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	NO	0
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	NO	1

Total System Construction Score 5

## 2. Hydrologic Sensitivity

Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	NO	2

Total Hydrologic Score 6

## 3. Potential Contaminant / Land Use - ZONE 1A

IOC Score VOC Score SOC Score Microbial Score

Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	YES	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

## Potential Contaminant / Land Use - ZONE 1B

Contaminant sources present (Number of Sources)	YES	2	2	2	1
(Score = # Sources X 2 ) 8 Points Maximum		4	4	4	2
Sources of Class II or III leacheable contaminants or	YES	5	2	2	
4 Points Maximum		4	2	2	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B Greater Than 50% Irrigated Agricultural Land		4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		12	10	10	6

## Potential Contaminant / Land Use - ZONE II

Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II Greater Than 50% Irrigated Agricultural Land		2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0

## Potential Contaminant / Land Use - ZONE III

Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0

Cumulative Potential Contaminant / Land Use Score 24 20 22 8

## 4. Final Susceptibility Source Score

16 15 15 14

## 5. Final Well Ranking

High High High High